(Currently Amended) 1. An electromechanical micromirror device, comprising:

a ~~device~~ single substrate with a 1st surface and a 2nd surface;

a control circuitry disposed on said 1st surface of said single substrate; and

a micromirror section disposed on said 2nd surface of said single substrate;

wherein said micromirror section comprises:
a micromirror; and

at least ~~1~~ one support structure for supporting said micromirror.

(Currently Amended) 2. The device of claim 1, wherein:

said control circuitry ~~is~~ comprising a circuit selected from the group consisting of: CMOS circuits, NMOS circuits, PMOS circuits, bipolar circuits, BiCMOS circuits, DMOS circuits, HEMT circuits, amorphous silicon thin film transistor circuits, polysilicon thin film transistor circuits, SiGe transistor circuits, SiC transistor circuits, GaN transistor circuits, GaAs transistor circuits, InP transistor circuits, CdSe transistor circuits, organic transistor circuits, and conjugated polymer transistor circuits.

(Currently Amended) 3. The device of claim 1, wherein:

said ~~device~~ single substrate ~~is~~ comprising a substrate selected from the group consisting of a silicon-on-insulator (SOI) substrate, a silicon substrate, a polycrystalline silicon substrate, a glass substrate, a plastic substrate, a ceramic substrate, a germanium substrate, a SiGe substrate, a SiC substrate , a sapphire substrate, a quartz substrate, a GaAs substrate, and an InP substrate.

(Currently Amended) 4. The device of claim 1, wherein:

said micromirror section additionally comprises at least ~~1~~ one addressing electrode for actuating said micromirror.

(Currently Amended) 5. The device of claim 4, additionally comprising:

at least ~~1~~ one electrically conductive routing line integral with said ~~device~~ single substrate that connects said control circuitry to said at least ~~1~~ one addressing electrode.

(Currently Amended) 6. The device of claim 5, wherein:

said at least ~~1~~ one electrically conductive routing line comprises a via through said single substrate and a metallization in said via.

(Currently Amended) 7. The device of claim 1, wherein:

said ~~device~~ single substrate additionally comprises an insulating layer between said ~~1st~~ first surface and said ~~2nd~~ second surface.

(Currently Amended) 8. The device of claim 1, wherein:

said micromirror ~~is~~ further comprising a metallic mirror.

(Currently Amended) 9. The device of claim 1, wherein:

said micromirror ~~is~~ further comprising a multilayer dielectric mirror.

(Currently Amended) 10. The device of claim 1, wherein:

~~the~~ said micromirror further comprising a substantially planar reflective side ~~of said micromirror is substantially planar~~ with neither recesses nor protrusions.

(Currently Amended) 11. The device of claim 1, wherein:

~~the~~ said micromirror further comprising a reflective surface ~~of said micromirror has~~ having no edges ~~that are~~ perpendicular to ~~the~~ a projection direction of ~~the~~ an incident light propagation vector onto ~~the plane of~~ said ~~device~~ single substrate.

(Currently Amended) 12. The device of claim 11, wherein:

said reflective surface of said micromirror ~~is in the shape of~~ further comprising a polygon-shaped reflective surface.

(Currently Amended) 13. The device of claim 12, wherein:

said polygon-shaped reflective surface is selected from the group consisting of a rectangle-shaped reflective surface and a hexagon-shaped reflective surface.

(Currently Amended) 14. The device of claim 1, wherein:

said micromirror section additionally comprises a torsion hinge ~~that is~~ disposed ~~to support~~ underneath and supporting said micromirror support structure; and

~~a pair of support structures for~~ said torsion hinge ~~that~~ further comprising a pair of supporting structures for supporting ~~supports~~ said torsion hinge on said substrate.

(Currently Amended) 15. The device of claim 1, wherein:

said micromirror section additionally comprises at least ~~1~~ one stopping member ~~that limits the~~ for limiting a rotation of said micromirror.

(Currently Amended) 16. The device of claim 15, wherein:

said at least ~~1~~ one stopping member comprises a 1st stopping member ~~that limits the~~ for limiting the rotation of said micromirror in a 1st direction; and

a 2nd stopping member ~~that limits the~~ for limiting the rotation of said micromirror in a direction opposite to said 1st direction.

(Currently Amended) 17. An array of electromechanical micromirror devices comprising:

~~a plurality~~ ~~of electromechanical micromirror devices disposed~~ ~~in a 1-dimensional or 2-dimensional array, comprising~~ a ~~device~~ single substrate with a 1st surface and a 2nd surface;

a control circuitry disposed on said 1st surface of said substrate; and

an array of micromirror sections disposed on said 2nd surface of said single substrate wherein each said micromirror section comprises a micromirror; and

~~at least 1~~ a support structure for supporting said micromirror.

(Currently Amended) 18. The array of claim 17, wherein:

said control circuitry ~~is~~ comprising a circuit selected from the group consisting of: CMOS circuits, NMOS circuits, PMOS circuits, bipolar circuits, BiCMOS circuits, DMOS circuits, HEMT circuits, amorphous silicon thin film transistor circuits, polysilicon thin film transistor circuits, SiGe transistor circuits, SiC transistor circuits, GaN transistor circuits, GaAs transistor circuits, InP transistor circuits, CdSe transistor circuits, organic transistor circuits, and conjugated polymer transistor circuits.

(Currently Amended) 19. The array of claim 17, wherein:

said ~~device~~ single substrate ~~is~~ comprising a substrate selected from the group consisting of a silicon-on-insulator (SOI) substrate, a silicon substrate, a polycrystalline silicon substrate, a glass substrate, a plastic substrate, a ceramic substrate, a germanium substrate, a SiGe substrate, a SiC substrate , a sapphire substrate, a quartz substrate, a GaAs substrate, and an InP substrate.

(Currently Amended) 20. The array of claim 17, wherein:

said micromirror section additionally comprises at least ~~1~~ one addressing electrode for actuating said micromirror.

(Currently Amended) 21. The array of claim 20, additionally comprising:

at least ~~1~~ one electrically conductive routing line integral with said ~~device~~ single substrate that connects said control circuitry to said at least ~~1~~ one addressing electrode of at least ~~1~~ one of said micromirror sections.

(Currently Amended) 22. The array of claim 21, wherein:

said at least ~~1~~ one electrically conductive routing line comprises a via through said single substrate and a metallization in said via.

(Currently Amended) 23. The array of claim 17, wherein:

said ~~device~~ single substrate additionally comprises an insulating layer between said ~~1st~~ first surface and said ~~2nd~~ second surface.

(Currently Amended) 24. The array of claim 17, wherein:

said micromirror ~~is~~ further comprising a metallic mirror.

(Currently Amended) 25. The array of claim 17, wherein:

said micromirror ~~is~~ further comprising a multilayer dielectric mirror.

(Currently Amended) 26. The array of claim 17, wherein:

~~the~~ said micromirror further comprising a substantially planar reflective side ~~of said micromirror is substantially planar~~ with neither recesses nor protrusions.

(Currently Amended) 27. The array of claim 17, wherein:

~~the~~ said micromirror further comprising a reflective surface ~~of said micromirror has~~ having no edges ~~that are~~ perpendicular to ~~the~~ a projection direction of ~~the~~ an incident light propagation vector onto ~~the plane of~~ said ~~device~~ single substrate.

(Currently Amended) 28. The array of claim 27, wherein:

said reflective surface of said micromirror ~~is in the shape of~~ further comprising a polygon-shaped reflective surface.

(Currently Amended) 29. The array of claim 28, wherein:

said polygon-shaped reflective surface is selected from the group consisting of a rectangle-shaped reflective surface and a hexagon-shaped reflective surface.

(Currently Amended) 30. The array of claim 17, wherein:

said micromirror section additionally comprises a torsion hinge ~~that is~~ disposed ~~to support~~ underneath and supporting said micromirror support structure; and

~~a pair of support structures for~~ said torsion hinge ~~that~~ further comprising a pair of supporting structures for supporting ~~supports~~ said torsion hinge on said substrate.

(Currently Amended) 31. The array of claim 17, wherein:

said micromirror section additionally comprises at least ~~1~~ one stopping member ~~that limits the~~ for limiting a rotation of said micromirror.

(Currently Amended) 32. The array of claim 17, wherein:

said at least ~~1~~ one stopping member comprises a 1st stopping member ~~that limits the~~ for limiting the rotation of said micromirror in a 1st direction; and

a 2nd stopping member ~~that limits the~~ for limiting the rotation of said micromirror in a direction opposite to said 1st direction.

(Currently Amended) 33. A spatial light modulator (SLM) comprising an array of electromechanical micromirror devices wherein said micro-mirror devices further comprising:

a single substrate with a 1st surface and a 2nd surface;

a control circuitry disposed on said 1st surface of said single substrate; and

an array of micromirror sections disposed on said 2nd surface of said single substrate wherein each said micromirror section comprises a micromirror; and

a support structure for supporting said micromirror.

~~an array according to claim 17.~~

(Currently Amended) 34. A method of fabricating an array of electromechanical ~~micromirror devices,~~ micromirrors comprising the steps of:

providing a ~~device~~ single substrate with a 1st surface and a 2nd surface;

forming control circuitry on said 1st surface of said single substrate; and

~~forming a plurality of micromirror sections on said 2nd surface of said single substrate, comprising the steps of:~~

forming a plurality of support structures on said second surface of said single substrate and forming a plurality of micromirrors on top of and supported by said support structures. ~~for supporting micromirrors on said 2nd surface of said substrate ; and~~

~~forming a plurality of micromirrors such that each said micromirror is supported by at least 1 said support structure~~.

(Currently Amended) 35. The method of claim 34, wherein:

said step of forming said control circuitry comprises a step of fabricating said control circuits selected from the group consisting of: CMOS circuits, NMOS circuits, PMOS circuits, bipolar transistor circuits, BiCMOS circuits, DMOS circuits, HEMT circuits, amorphous silicon thin film transistor circuits, polysilicon thin film transistor circuits, SiGe transistor circuits, SiC transistor circuits, GaN transistor circuits, GaAs transistor circuits, InP transistor circuits, CdSe transistor circuits, organic transistor circuits, and conjugated polymer transistor circuits.

(Currently Amended) 36. The method of claim 34, wherein:

said step of providing said single substrate further comprising a step of providing said single ~~device~~ substrate is selected from ~~the~~ a group consisting of a silicon-on-insulator (SOI) substrate, a silicon substrate, a polycrystalline silicon substrate, a glass substrate, a plastic substrate, a ceramic substrate, a germanium substrate, a SiGe substrate, a SiC substrate , a sapphire substrate, a quartz substrate, a GaAs substrate, and an InP substrate.

(Currently Amended) 37. The method of claim 34, wherein:

said step of forming said ~~micromirror~~ ~~sections~~ micromirrors additionally comprises a step of forming a plurality of addressing electrodes for actuating said ~~plurality of~~ micromirrors.

(Currently Amended) 38. The method of claim 37, additionally comprising a step of:

forming a plurality of electrically conductive routing lines ~~integral~~ integrated with said ~~device~~ single substrate ~~that connects~~ for connecting said control circuitry to said plurality of addressing electrodes.

(Currently Amended) 39. The method of claim 38, wherein said step of:

forming said plurality of electrically conductive routing lines comprises the steps of:

forming at least ~~1~~ one via through said substrate; and

forming a metallization in said at least ~~1~~ one via.

(Currently Amended) 40. The method of claim 34, wherein:

said step of providing said single substrate further comprising a step of providing a single ~~device~~ substrate ~~additionally~~ comprises an insulating layer between said 1st surface and said 2nd surface.

(Currently Amended) 41. The method of claim 34, wherein:

said step of forming a plurality of micromirrors comprises a step of forming a reflective metallic coating on said micromirrors.

(Currently Amended) 42. The method of claim 34, wherein:

said step of forming a plurality of micromirrors comprises a step of forming a reflective multilayer dielectric coating on said micromirrors.

(Currently Amended) 43. The method of claim 34, wherein said step of forming said ~~micromirror sections~~ micromirrors comprises the steps of:

forming said plurality of micromirror support structures ~~such that it is~~ embedded in a sacrificial layer ~~of sacrificial material~~;

planarizing a top surface of said ~~layer such that said~~ sacrificial layer and ~~the top of~~ said micromirror support structures ~~are substantially planar~~;

depositing a micromirror material on said ~~planar~~ top surface;

patterning said micromirror material to form a plurality of micromirrors; and

removing said sacrificial layer by an etching process.

(Currently Amended) 44. The method of claim 43, wherein:

said step of forming said microstructures in said sacrificial layer further comprising a step of forming said microstructures in a layer composed of a material ~~is~~ selected from the group consisting of a photoresist polymer, a silicon oxide, a silicon nitride, a silicon oxynitride, and an amorphous silicon.

(Currently Amended) 45. The method of claim 43, wherein:

said step of planarizing said top surface further comprising a step of applying ~~comprises~~ a chemical mechanical polishing (CMP) process.

(Currently Amended) 46. The method of claim 34, wherein said step of forming a plurality of micromirrors comprises a step of:

patterning said micromirrors to have no edges ~~that are~~ perpendicular to ~~the~~ a projection direction of ~~the~~ an incident light propagation vector onto ~~the~~ a plane of said ~~device~~ single substrate.

(Currently Amended) 47. The method of claim 46, wherein:

said step of forming said micromirrors further comprising a step of patterning at least one of ~~each~~ said micromirror ~~is patterned to be in the shape of~~ as a polygon-shaped micromirror.

(Currently Amended) 48. The method of claim 47, wherein:

said step of forming said polygon-shaped micromirror is a step of forming said micromirror either as a rectangle-shaped micromirror or a hexagon-shaped micromirror ~~selected from the group consisting of a rectangle and a hexagon~~.

(Currently Amended) 49. The method of claim 34, additionally comprising a step of:

forming a torsion hinge for supporting ~~each~~ said ~~mirror~~ support ~~structure,~~ structures by forming a hinge support followed by forming a torsion hinge on top of and supported by said hinge support. ~~said step comprising:~~

~~forming a plurality of supports for supporting torsion hinges; and;~~

~~forming a plurality of torsion hinges.~~

(Currently Amended) 50. The method of claim 34, additionally comprising the step of:

forming at least ~~1~~ one stopping member ~~that limits~~ for limiting a ~~the~~ rotation of ~~each~~ said micromirror.

(Currently Amended) 51. The method of claim 50, wherein said step of forming at least ~~1~~ one stopping member comprises:

forming a 1st stopping member for limiting a ~~the~~ rotation of said micromirror in a 1st direction; and

forming a 2nd stopping member for limiting a ~~the~~ rotation of said micromirror in a direction opposite to said 1st direction.

(Currently Amended) 52. A method of fabricating an array of electromechanical micromirrors ~~micromirror devices~~, comprising the steps of:

providing a single silicon-on-insulator substrate with an epitaxial top silicon layer above an insulator layer~~, and~~ supported by a bottom silicon layer;

forming control circuitry on said epitaxial top silicon layer;

removing said bottom silicon layer, thereby exposing the insulator layer;

~~forming a plurality of micromirror sections on said exposed insulator layer, comprising the steps of:~~

forming a plurality of support structures followed by ~~for supporting micromirrors; and~~ forming a plurality of micromirrors ~~such that each said micromirror is~~ on top of and supported by ~~at least 1~~ said support structures ~~structure~~.

(Currently Amended) 53. The method of claim 52, wherein:

said step of forming said control circuitry comprises a step of fabricating said control circuits selected from ~~the~~ a group consisting of: CMOS circuits, NMOS circuits, PMOS circuits, bipolar transistor circuits, BiCMOS circuits, and DMOS circuits.

(Currently Amended) 54. The method of claim 52, wherein:

said step of removing said bottom silicon layer comprises a step of applying a backgrinding step to remove said bottom silicon layer.

(Currently Amended) 55. The method of claim 52, wherein:

said step of removing said bottom silicon layer comprises a step of applying a chemical mechanical polishing (CMP) step to remove said bottom silicon layer.

(Currently Amended) 56. The method of claim 52~~, wherein said step of forming said micromirror section~~ additionally comprises a step of:

forming a plurality of addressing electrodes for actuating said plurality of micromirrors.

(Currently Amended) 57. The method of claim 56, additionally comprising a step of:

forming a plurality of electrically conductive routing lines ~~integral~~ integrated with said ~~device~~ single substrate ~~that connects~~ for connecting said control circuitry to said plurality of addressing electrodes.

(Currently Amended) 58. The method of claim 57, wherein said step of forming said plurality of electrically conductive routing lines comprises the steps of:

forming at least ~~1~~ one via through said substrate; and

forming a metallization in said ~~at least 1~~ via.

(Currently Amended) 59. The method of claim 52, wherein said step of forming said ~~micromirror sections~~ micromirrors the steps of:

forming said plurality of micromirror support structures ~~such that it is~~ embedded in a sacrificial layer ~~of sacrificial material~~;

planarizing a top surface of said ~~layer such that said~~ sacrificial layer and ~~the top of~~ said micromirror support structures ~~are substantially planar~~;

depositing a micromirror material on said ~~planar~~ top surface;

patterning said micromirror material to form a plurality of micromirrors; and

removing said sacrificial layer by an etching process.

(Currently Amended) 60. The method of claim 59, wherein:

said step of planarizing said top surface further comprising a step of applying ~~comprises~~ a chemical mechanical polishing (CMP) process.